Space Weather Forecast

Issued on Tuesday, 06 June 2023 at 01:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate flares (R1/Minor-R2/Moderate radio blackouts). Slight chance of a G1-G2/Minor-Moderate Geomagnetic storm due to CME effects 07-08 June.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, but with frequent Common-Class flares. There are a few large groups on the visible disc, the largest of and most complex of which is nearing centre disc. Another large region has now rotated across the western limb and is no longer visible. A newer region near the southeast limb is starting to reveal some complexity. The other regions appear to either be relatively small, simple, or both.
No Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery during the period.

Solar Wind / Geomagnetic Activity: Solar winds have shown evidence of some slight disturbance. Wind speeds were initially ambient around 350 km/s, increasing around 05/0500 UTC to become slightly elevated with a peak of 463 km/s at 05/0803 UTC. Winds later declined to ambient levels around 05/1245 UTC, where they have remained on a downwards trend and are currently around 360 km/s. The total magnetic field has mainly been at moderate levels. The important north-south component, Bz, was initially negative, becoming mostly positive from 05/0545 UTC. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain generally Low but there is a chance of Moderate activity, and a very slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: A filament lift-off starting around 04/0900UTC from the southwest quadrant gave a CME. This is currently thought more likely to miss Earth, however a glancing blow is possible either late Day 2 or into Day 3 (07-08 June). Some potential transient CME has been observed in the past 24hrs and this may continue into the start of the Day 1. Generally solar winds expected to remain generally slow-ambient or at slightly elevated levels. Perhaps seeing enhancement Day 2-3 should Earth experience any CME effects.

Geomagnetic activity is forecast to be mainly Quiet to Unsettled (Kp0-3) with a slight chance of Active (Kp4) intervals on Day 1, should we continue to see any transitory enhancement. Activity possibly increasing late Day 3 into Day 4 (07-08 June) should we see any CME effects, becoming more Unsettled with a chance of Active intervals and a slight chance of isolated G1/Minor storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be at background levels with solar radiation storms unlikely to occur. However, there is a slight but declining chance of reaching the S1/Minor Storm threshold should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	15	20	10
Strong	G3	No	1	1	2	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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